and a pair of field glasses of two inches aperture, with a direct-vision spectroscope attached to one eye-piece. The three-inch telescope was to be used in comparing the color of the prominences. With this purpose in view, a low power was employed, so that the entire rim of the hidden sun could be seen at once. Cross wires at focus served for locating the prominences in position angle. Tachini and a few others have seen what appeared to be white prominences. Whether this was a real phenomenon or a psychological effect has been questioned, and among the twelve observations proposed by the eclipse committee of the Astronomical and Astrophysical Society, one upon prominence color was included, in order that a general effort to note color might lead to more definite conclusions. Purkinje's investigations have shown that the brightest prominences should look the reddest. Therefore, slight variations in redness would not necessarily indicate difference in constitution. Miss Furness is familiar with the appearance of a prominence as seen in the hydrogen line of the spectrum. She noted no marked difference in color in the several prominences seen around the sun's limb during eclipse. A variation toward the pink was clearly observable in one small prominence in the S. E. quadrant. A very large and beautiful prominence in the form of the banyan tree was observed in the S. W. quadrant. This was of the usual red color.

The direct vision spectroscope attached to the field-glass was a McClean star spectroscope, with the cylindrical lens removed. The object in view was to examine the distribution of coronium. It has been claimed that the green line of coronium is as plainly discernible in the rifts of the corona as in the streamers. With the simple apparatus above described (first suggested by Mr. Maunder) if it is properly adjusted, and if the continuous spectrum of the inner corona is not too bright, the question of distribution might be well tested. If the coronium is confined to the regions determined by the visible outline of the corona, the green image in the one glass would correspond in form to the composite image in the other. If, on the contrary, the coronium is equally distributed in streamers and rifts, the green image would indicate this by its uniformity of outline. Our apparatus was tested by examining an opening of the form of the corona, cut in cardboard, and held before a Bunsen flame, emitting sodium and lithium light. The red and yellow images were sharply defined.

The observation during totality was, however, without decided result. The continuous spectrum of the inner corona was so bright that the green image could not be separated from it. Clear separation being found impossible, attention was turned to the regions above and below the continuous spectrum limits, to note, if possible, any green extensions. These could not be seen, though the brightness of the field might have rendered this doubtful in any case. Probably the dispersion of the prisms was insufficient. The inner corona was much more brilliant than I had expected.

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NOTES ON INORGANIC CHEMISTRY.

AT the recent meeting of the Iron and Steel Institute of Great Britain a number of very interesting papers were read, which are abstracted in *Nature* and from which we make note of the following:

A paper by Mr. B. Talbot on the open-hearth continuous steel process as introduced in the Pencoyd Steel Works in Pennsylvania. Here a basic tilting furnace of seventy-five tons capacity is used, and is charged at once with fluid metal, at a great saving of fuel and time. The general advantages of the furnace were stated to be increased output, increased yield, saving in repair, and saving in labor. A long discussion followed the paper and the opinion was general that this process represented an important advance in open-hearth steel practice.

A description was given by Mr. A. Greiner of the first blowing-engine worked by blast-furnace gas. This is a 600 H. P. engine at the Cockerill works, Belgium, and has been running since last November with unpurified gases from the Seraing blast furnace.

Mr. C. von Schwarz discussed the manufacture of cement from blast-furnace slag. Various attempts at the utilization of the slag

in the past have met with little success, but now a method has been devised and is in use in Germany and Belgium whereby the cement manufactured commands a higher price in the market than ordinary Portland cement.

An apparatus for equalizing the temperature of the hot blasts was described by Mr. L. F. Gjers and Mr. J. H. Harrison. Instead of the blast going directly from the stoves to the tuyers, whereby the temperature falls continuously from the turning on of one stove until a fresh stove is used, the blast passes from the stove through another small stove filled with checker work, and while entering on one side with varying temperature, it leaves the small stove at an even mean temperature.

The affairs of the Institute were shown to be in a very flourishing condition, 110 members being added during the year. The Bessemer gold medal for 1900 was presented to M. Henri de Wendel, the eminent French metallurgist, in recognition of his services to metallurgy in developing the iron ore resources of French and German Lorraine.

Mr. Andrew Carnegie announced his intention of founding a scholarship in connection with the Institute, for the advancement of research in connection with iron and steel.

THE same number of *Nature* gives an account of the Royal Society Converzazione of May 9th, but there appear to have been few exhibits in the line of chemistry. Professor W. A. Shenstone showed a quantity of crude non-splintering silica for use in apparatus of silica, recently described in these NOTES, and also several rods, tubes, a Giessler tube and a mercury thermometer of silica. Dr. Thorpe exhibited some examples of leadless glazed ware, and Mr. H. B. Hartley and Mr. H. L. Bowman gave a demonstration of the properties of crystals yielding double-refracting liquids on fusion. These substances, among which are para-azoxyanisol, para-azoxyphenetol, and cholesteryl benzoate, when fused give liquids which possess the properties of double refraction and dichroism, although the evidence of their elasticity, viscosity, and dielectric capacity shows them to be undoubtedly liquids.

APROPOS of Professor Shenstone's work on fused quartz a paper has appeared in the *Proceedings* of the Royal Dublin Society, by Professor J. Joly, on the 'Theory of the Formation of Silicates in Igneous Rocks,' in which he discusses the temperature range of the viscosity of quartz. He finds that when heated to 800° quartz becomes plastic and that as high as 1500° it is a thick liquid. This softening point is much lower than is commonly supposed, and makes it easier to understand the facility with which it is worked by Professor Shenstone. At the same time it lends more encouragement to the hope of a wide use of quartz for apparatus.

No little comment has been occasioned, especially in England, by the publication in the *Zeitschrift für angewandte Chemie* of a lecture delivered before the German Emperor by Professor Bredt. The title of the lecture was 'Technical Education and the Importance of Scientific Training,' and statistics were given of the three great dye-stuff factories of Germany. From these it appears that the Badische Anilin- und Sodafabrik, of Ludwigshafen, employs 6207 workmen, including 146 chemists and 75 engineers. The Farbewerke vorm. Meister Lucius und Brüning of Höchst am Main and the Farbenfabriken vorm. Fr. Bayer & Co., of Elberfeld, each employ 130 chemists. With these facts before one, it is not difficult to understand that Germany leads the world in dye stuffs.

J. L. H.

NOTES ON PHYSICS.

THE FREEZING POINT OF WATER AND PRESSURE.

IN the *Annalen der Physik* for May, 1900, G. Tammann describes some remarkable experimental studies of the variation of the freezing-point of water with pressure. It appears that that there are three kinds of ice differing from each other in crystalline structure. Counting these three kinds of ice, five forms of water are now known, namely, vapor, liquid, ice I. (common ice), ice II., and ice III. A given pair of these forms (phases) of water can exist together in equilibrium only at definite temperatures and pressures. That is, for a given temperature the pressure at which two phases may coexist is definite. Thus ice I. and water coexist at 0°C. under atmospheric pressure, at —3°.7C. under 500 atmospheres, at — 8°.4C. under 1000